

Cement Masons, Concrete Finishers, Segmental Pavers, and Terrazzo Workers

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Significant Points

- Job opportunities are expected to be favorable.
- Most learn on the job, either through formal 3-year or 4-year apprenticeship programs or by working as helpers.
- Like many other construction trades, these workers may experience reduced earnings and layoffs during downturns in construction activity.
- Cement masons often work overtime, with premium pay, because once concrete has been placed, the job must be completed.

Nature of the Work

Cement masons, concrete finishers, and terrazzo workers all work with concrete, one of the most common and durable materials used in construction. Once set, concrete—a mixture of Portland cement, sand, gravel, and water—becomes the foundation for everything from decorative patios and floors to huge dams or miles of roadways.

Cement masons and *concrete finishers* place and finish the concrete. They also may color concrete surfaces; expose aggregate (small stones) in walls and sidewalks; or fabricate concrete beams, columns, and panels. In preparing a site for placing concrete, cement masons first set the forms for holding the concrete and properly align them. They then direct the casting of the concrete and supervise laborers who use shovels or special tools to spread it. Masons then guide a straightedge back and forth across the top of the forms to “screed,” or level, the freshly placed concrete. Immediately after leveling the concrete, masons carefully smooth the concrete surface with a “bull float,” a long-handled tool about 8 by 48 inches that covers the coarser materials in the concrete and brings a rich mixture of fine cement paste to the surface.

After the concrete has been leveled and floated, concrete finishers press an edger between the forms and the concrete and guide it along the edge and the surface. This produces slightly rounded edges and helps prevent chipping or cracking. Concrete finishers use a special tool called a “groover” to make joints or grooves at specific intervals that help control cracking. Next, they trowel the surface using either a powered or hand trowel, a small, smooth, rectangular metal tool.

Sometimes, cement masons perform all the steps of laying concrete, including the finishing. As the final step, they retrowel the concrete surface back and forth with powered and hand trowels to create a smooth finish. For a coarse, nonskid finish, masons brush the surface with a broom or stiff-bristled brush. For a pebble finish, they embed small gravel chips into the surface. They then wash any excess cement from the exposed chips with a mild acid solution. For color, they use colored premixed concrete. On concrete surfaces that will remain exposed after the forms are stripped, such as columns, ceilings, and wall panels, cement masons cut away high spots and loose concrete with hammer and chisel, fill any large indentations with a Portland cement paste, and smooth the surface with a carborundum stone. Finally, they coat the exposed area with a rich Portland cement mixture, using either a special tool or a coarse cloth to rub the concrete to a uniform finish.

Throughout the entire process, cement masons must monitor how the wind, heat, or cold affects the curing of the concrete. They must have a thorough knowledge of concrete characteristics so that, by using sight and touch, they can determine what is happening to the concrete and take measures to prevent defects.

Segmental pavers lay out, cut, and install pavers, which are flat pieces of masonry usually made from compacted concrete or brick. Pavers are used to pave paths, patios, playgrounds, driveways, and steps. They are manufactured in various textures and often interlock together to form an attractive pattern. Segmental pavers first prepare the site by removing the existing pavement or soil. They grade the remaining soil to the proper depth and determine the amount of base material that is needed, which depends on the local soil conditions. They then install and compact the base material, a granular material that compacts easily, and lay the pavers from the center out, so that any trimmed pieces will be on the outside rather than in the center. Then, they install edging materials to prevent the pavers from shifting and fill the spaces between the pavers with dry sand.

Terrazzo workers create attractive walkways, floors, patios, and panels by exposing marble chips and other fine aggregates on the surface of finished concrete. Much of the preliminary work of terrazzo workers is similar to that of cement masons. Attractive, marble-chip terrazzo requires three layers of materials. First, cement masons or terrazzo workers build a solid, level concrete foundation that is 3 to 4 inches deep. After the forms are removed from the foundation, workers add a 1-inch layer of sandy concrete. Before this layer sets, terrazzo workers partially embed metal divider strips in the concrete wherever there is to be a joint or change of color in the terrazzo. For the final layer, terrazzo workers blend and place into each of the panels a fine marble chip mixture that may be color-pigmented. While the mixture is still wet, workers toss additional marble chips of various colors into each panel and roll a lightweight roller over the entire surface.

When the terrazzo is thoroughly dry, helpers grind it with a terrazzo grinder, which is somewhat like a floor polisher, only much heavier. Slight depressions left by the grinding are filled with a matching grout material and hand-troweled for a smooth, uniform surface. Terrazzo workers then clean, polish, and seal the dry surface for a lustrous finish.

Working Conditions

Concrete, segmental paving, or terrazzo work is fast-paced and strenuous, and requires continuous physical effort. Because most finishing is done at floor level, workers must bend and kneel often.



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Many jobs are outdoors, and work is generally halted during inclement weather. The work, either indoors or outdoors, may be in areas that are muddy, dusty, or dirty. To avoid chemical burns from uncured concrete and sore knees from frequent kneeling, many workers wear kneepads. Workers usually also wear water-repellent boots while working in wet concrete.

Employment

Cement masons, concrete finishers, segmental pavers, and terrazzo workers held about 190,000 jobs in 2002; segmental pavers and terrazzo workers accounted for only a small portion of the total. Most cement masons and concrete finishers worked for concrete contractors or for general contractors on projects such as highways; bridges; shopping malls; or large buildings such as factories, schools, and hospitals. A small number were employed by firms that manufacture concrete products. Most segmental pavers and terrazzo workers worked for special trade contractors who install decorative floors and wall panels.

Only about 1 out of 20 cement masons, concrete finishers, segmental pavers, and terrazzo workers were self-employed, a smaller proportion than in other building trades. Most self-employed masons specialized in small jobs, such as driveways, sidewalks, and patios.

Training, Other Qualifications, and Advancement

Most cement masons, concrete finishers, segmental pavers, and terrazzo workers learn their trades either through on-the-job training as helpers, or through 3-year or 4-year apprenticeship programs. Many masons and finishers first gain experience as construction laborers. (See the statement on construction laborers elsewhere in the *Handbook*.)

When hiring helpers and apprentices, employers prefer high school graduates who are at least 18 years old and in good physical condition, and who have a driver's license. The ability to get along with others also is important because cement masons frequently work in teams. High school courses in general science, vocational-technical subjects, mathematics, blueprint reading, or mechanical drawing provide a helpful background.

On-the-job training programs consist of informal instruction, in which experienced workers teach helpers to use the tools, equipment, machines, and materials of the trade. Trainees begin with tasks such as edging, jointing, and using a straightedge on freshly placed concrete. As training progresses, assignments become more complex, and trainees can usually do finishing work within a short time.

Three-year or four-year apprenticeship programs, usually jointly sponsored by local unions and contractors, provide on-the-job training in addition to a recommended minimum of 144 hours of classroom instruction each year. A written test and a physical exam may be required. In the classroom, apprentices learn applied mathematics, blueprint reading, and safety. Apprentices generally receive special instruction in layout work and cost estimation. Some workers learn their jobs by attending trade or vocational-technical schools.

Cement masons, concrete finishers, segmental pavers, and terrazzo workers should enjoy doing demanding work. They should take pride in craftsmanship and be able to work without close supervision.

With additional training, cement masons, concrete finishers, segmental pavers, or terrazzo workers may become supervisors for masonry contractors. Some eventually become owners of businesses employing many workers and may spend most of their time as managers rather than practicing their original trade. Others move into closely related areas such as construction management, building inspection, or contract estimation.

Job Outlook

Opportunities for cement masons, concrete finishers, segmental pavers, and terrazzo workers are expected to be favorable as the demand meets the supply of workers trained in this craft. In addition, many potential workers may prefer work that is less strenuous and has more comfortable working conditions.

Employment of cement masons, concrete finishers, segmental pavers, and terrazzo workers is expected to grow faster than the average for all occupations through 2012. These workers will be needed to build highways, bridges, subways, factories, office buildings, hotels, shopping centers, schools, hospitals, and other structures. In addition, the increasing use of concrete as a building material will add to the demand. More cement masons also will be needed to repair and renovate existing highways, bridges, and other structures. In addition to job growth, other openings will become available as experienced workers transfer to other occupations or leave the labor force.

Employment of cement masons, concrete finishers, segmental pavers, and terrazzo workers, like that of many other construction workers, is sensitive to the fluctuations of the economy. Workers in these trades may experience periods of unemployment when the overall level of construction falls. On the other hand, shortages of these workers may occur in some areas during peak periods of building activity.

Earnings

In 2002, the median hourly earnings of cement masons and concrete finishers were \$14.74. The middle 50 percent earned between \$11.52 and \$20.02. The top 10 percent earned over \$26.02, and the bottom 10 percent earned less than \$9.31. Median hourly earnings in the industries employing the largest numbers of cement masons and concrete finishers in 2002 are shown below:

Nonresidential building construction	\$16.24
Highway, street, and bridge construction	15.37
Other specialty trade contractors	15.19
Foundation, structure, and building exterior contractors	14.52
Residential building construction	14.44

In 2002, the median hourly earnings of terrazzo workers and finishers were \$13.42. The middle 50 percent earned between \$10.46 and \$17.72. The top 10 percent earned over \$23.70, and the bottom 10 percent earned less than \$8.94.

Like those of other construction trades workers, earnings of cement masons, concrete finishers, segmental pavers, and terrazzo workers may be reduced on occasion because poor weather and downturns in construction activity limit the amount of time they can work. Cement masons often work overtime, with premium pay, because once concrete has been placed, the job must be completed.

Many cement masons, concrete finishers, segmental pavers, and terrazzo workers belong to the Operative Plasterers' and Cement Masons' International Association of the United States and Canada, or to the International Union of Bricklayers and Allied Craftworkers. Some terrazzo workers belong to the United Brotherhood of Carpenters and Joiners of the United States. Nonunion workers generally have lower wage rates than do union workers. Apprentices usually start at 50 to 60 percent of the rate paid to experienced workers.

Related Occupations

Cement masons, concrete finishers, segmental pavers, and terrazzo workers combine skill with knowledge of building materials to con-

struct buildings, highways, and other structures. Other occupations involving similar skills and knowledge include brickmasons, blockmasons, and stonemasons; carpet, floor, and tile installers and finishers; drywall installers, ceiling tile installers, and tapers; and plasterers and stucco masons.

Sources of Additional Information

For information about apprenticeships and work opportunities, contact local concrete or terrazzo contractors, locals of unions previously mentioned, a local joint union-management apprenticeship committee, or the nearest office of the State employment service or apprenticeship agency.

For general information about cement masons, concrete finishers, segmental pavers, and terrazzo workers, contact:

- Associated Builders and Contractors, Workforce Development Department, 4250 North Fairfax Dr., 9th Floor, Arlington, VA 22203.
- Associated General Contractors of America, Inc., 333 John Carlyle St., Alexandria, VA 22314. Internet: <http://www.agc.org>
- International Union of Bricklayers and Allied Craftworkers, International Masonry Institute, The James Brice House, 42 East St., Annapolis, MD 21401. Internet: <http://www.imiweb.org>
- Operative Plasterers' and Cement Masons' International Association of the United States and Canada, 14405 Laurel Place, Suite 300, Laurel, MD 20707. Internet: <http://www.opcmia.org>
- National Terrazzo and Mosaic Association, 110 E. Market St., Suite 200 A, Leesburg, VA 20176.
- Portland Cement Association, 5420 Old Orchard Rd., Skokie, IL 60077. Internet: <http://www.portcement.org>
- United Brotherhood of Carpenters and Joiners of America, 50 F St. NW., Washington, DC 20001. Internet: <http://www.carpenters.org>

For general information about cement masons and concrete finishers, contact:

- National Concrete Masonry Association, 13750 Sunrise Valley Dr., Herndon, VA 20171-3499. Internet: <http://www.ncma.org>

There are more than 500 occupations registered by the U.S. Department of Labor's National Apprenticeship system. For more information on the Labor Department's registered apprenticeship system and links to State apprenticeship programs, check their website: <http://www.doleta.gov>